

BONE CROSSING BRIDGE  
Texas Historic Bridges Recording Project  
Spanning Cowhouse Creek at County Route 137  
(Moved to Texas Early Day Tractor and  
Engine Association Fairgrounds, Temple, Bell County)  
Gatesville Vicinity  
Coryell County  
Texas

HAER No. TX-29

HAER  
TEX  
SO-GATVILY  
1-

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD

National Park Service  
Department of the Interior  
1849 C St., NW  
Washington, DC 20240

HISTORIC AMERICAN ENGINEERING RECORD

BONE CROSSING BRIDGE

HAER No. TX-29

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**Location:** Spanning Cowhouse Creek at County Route 137, Gatesville vicinity, Coryell County, Texas.  
(Moved to Texas Early Day Tractor and Engine Association Fairgrounds, Temple, Bell County, Texas.)  
UTM: 14/601370/3475110  
USGS: Purnela, Texas, quadrangle (1995).

**Date of Construction:** 1915.

**Designer:** Austin Brothers, Dallas, Texas.

**Builder:** Austin Brothers, Dallas, Texas.

**Present Owner:** Texas Early Day Tractor and Engine Association, Temple, Texas.

**Present Use:** Pedestrian bridge.

**Significance:** The Bone Crossing Bridge is an early example of a bridge designed by Austin Brothers, Dallas, a major Texas bridge builder during this period. It is also a well-preserved example of the once-common Warren pony truss. In 1995 the bridge was moved to the Early Day Tractor and Engine Association fairgrounds, where it complements a collection of antique agricultural machinery.

**Historian:** Dr. Mark M. Brown, August 1996.

**Project Information:** This document was prepared as a part of the Texas Historic Bridges Recording Project performed during the summer of 1996 by the Historic American Engineering Record (HAER). The project was sponsored by the Texas Department of Transportation (TxDOT).

## I. Description

The Bone Crossing Bridge across Cowhouse Creek is oriented northeast-southwest.<sup>1</sup> It consists of two riveted steel Warren pony trusses and two timber approach spans with an overall length of 169'-0". Starting at the northeast abutment (closest to the county seat at Gatesville), the spans are 18'-6", 40'-0", 90'-0", and 18'-6" long. Spans No. 1 and 4 are timber stringer approaches. The width is a minimum 11'-3" between curbs (see Figure 1).

Span No. 2, the 40'-0" Warren pony truss, has three panels, a single set of verticals, and measures 5'-3" between top and bottom chords. The top chord is a 7" American Standard I-beam, while the diagonals and the verticals are 7" channels. Two angles 2 1/2" x 2" make up the bottom chord except between panel points L2 and L4, where slightly heavier 3 1/2" x 2 1/2" angles are used (see Figure 2).

The No. 3 span is a five-panel Warren pony truss. Like its shorter neighbor, it has a single set of verticals, but measures 9'-0" between top and bottom chords. A 10" I-beam is used for the top chord, including end posts. Verticals and diagonals are composed of two angles with varied flange lengths of 2 1/2", 3", or 3 1/2" x 2 1/2". Between panel points L2 and L8 the bottom chord is fabricated from two 5" x 3 1/2" angles. Members L0-L2 and L8-L9 are 3" x 2 1/2" angles (see Figure 3). The floor beams for both trusses are 12"-deep I-beams. Dimensions of the lower lateral cross-bracing are unknown.

The names of several noted steel companies appear on the webs of the bridge's members. The top chords of both spans were rolled by Jones and Laughlin, presumably at the Pittsburgh Works. Cambria Steel Company of Johnstown, Pennsylvania, made the deck beams for span No. 3, while Lackawanna, firmly established by 1915 outside Buffalo, New York, rolled the deck beams for span No. 2. Each truss retains a builder's plate that lists the county commissioners, the fabricator, and the date.

Before it was moved to its current location, the Bone Crossing Bridge also had a variety of abutments and piers. The northeast abutment supporting the No. 1 approach span was mortared masonry. A concrete wall 1'-0" thick at its base and 2'-0" thick at the top supported spans 1 and 2. Two 3'-0"-diameter concrete columns, connected by a 2'-0" thick web wall in a "dumbbell" arrangement common to many Austin Brothers bridges at the time, formed the pier between spans 2 and 3. A 2'-0" thick concrete wall supported span No. 3 and the No. 4 approach span. The southwestern abutment was concrete.

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<sup>1</sup> This description is based on conditions at the original location. All dimensions that follow are approximate and are based on a bridge inspection report prepared by William F. Kelm, July 29, 1994 (Texas Department of Transportation District Office, Waco, Texas), and the author's field measurements taken in August 1996.

## II. History

The Bone Crossing Bridge is locally significant as a link between a rural community and its market. It is a well-preserved example of a once-common truss type and typical of the Austin Brothers Bridge Company's early work.

### A. Pearl Community and Bone Crossing

The Bone Crossing Bridge connected the rural community of Pearl with Coryell County's seat at Gatesville. As with many central and eastern Texas counties, Coryell saw a shift from livestock to agricultural, particularly cotton, production. In Coryell this transition happened after the turn of the century. By 1909 nearly half of the county's cultivated acreage was planted with cotton. More than half of the farmers were tenants. Getting the bounty of the land to market was a problem because, while cotton gins were located throughout the county, railroads serviced a limited number of communities. Cowhouse Creek, the county's second most important drainage, lay between Pearl and the important depot at Gatesville. Finally, before 1920, most county roads were unimproved dirt lanes running between property lines.<sup>2</sup>

Originally known as Wayback, Pearl was probably well established by 1884, when it received a post office. Always a modest locality, it had a vibrant social life focused around its churches and small stores. The churches are still the community's most prominent feature today. The A. J. Bone family settled on Cowhouse Creek after the Civil War and gave their name to the crossing.<sup>3</sup>

### B. Contracting for the Bridge

By 1914 the Precinct No. 1 Road Supervisor was reporting that a "Bridge on Cowhouse at Bone Crossing" was required. Whether it was such reports that brought results, or now-lost petitions of cotton farmers seeking a reliable route across one of Texas's innumerable flash-flood prone creeks, is uncertain. In the following year, however, the Commissioners' Court took bids for five bridges: three across Cowhouse Creek and two across Coryell Creek, which is north and east of Gatesville. The final contract was awarded on March 8, 1915, to Austin Brothers of

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<sup>2</sup> Zelma Scott, *A History of Coryell County, Texas* (Austin, Texas: Texas State Historical Association, 1965), pp. 155-59, 171.

<sup>3</sup> For a general history of Pearl, see Charles E. Freeman, *History of Pearl, Texas*, 2nd ed., (Copperas Cove, Texas: self-published, 1974), or Coryell County Genealogical Society, *Coryell County, Texas Families: 1854-1985* (Gatesville, Texas: Coryell County Genealogical Society, 1986), pp. 63-64, 132-33.

Dallas for a total amount of \$10,500. Details for the bonds bearing six percent interest that would cover \$5,500 of the cost were finalized shortly thereafter.<sup>4</sup>

### C. Austin Brothers

In the 1910s, the bridge fabrication and erection business of George L. and Frank E. Austin became the dominant bridge fabricators in Texas. George Austin entered the business in 1889 as southern agent for the George E. King Bridge Company, Des Moines, Iowa. The brothers organized an independent company in 1908 and acquired a site for a fabrication plant two years later. The wide variety of steel company names embossed on the webs of the Bone Crossing Bridge's beams strongly suggests that Austin Brothers maintained an inventory for the fabrication plant without favor to shipping distance or to steel manufacturer. In 1918, Charles R. Moore, a senior executive with the company, purchased the contracting and erection part of the business and reorganized it under the name Austin Brothers Bridge Company.<sup>5</sup>

The simplicity of the Warren truss's design with its equilateral triangles and parallel chords made it popular for shorter single-lane spans.<sup>6</sup> Austin Brothers, as might be presumed of other bridge companies, pre-engineered a variety of Warren pony trusses as a means of reducing costs and thereby improving their competitive position (see Figures 4 and 5). Consequently, Austin Brothers were able to fabricate this type of bridge quite rapidly and economically. Span No. 2 at Bone Crossing is similar, but not identical, to patterns 40-C and 45-B in Figure 4. Likewise the 90'-0" span is similar to pattern 92-A (Figure 5).

The simplicity of the Warren pony truss and the corresponding simplicity of panel points provides an excellent opportunity to illustrate an argument advanced by Barbara Stocklin, Environmental Affairs Division, Texas Department of Transportation. In the course of mitigation research on numerous Warren pony trusses, Stocklin concluded that each bridge fabricator had distinctive rivet and gusset plate patterns. A comparison of the rivet and gusset plate pattern at U0 of the Bone Crossing Bridge trusses with similar connections on other documented Austin bridges suggests that two such diagnostic features are (1) rows of field bolts arranged perpendicular to the axis of both the top chord and inclined end post and (2) a gusset

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<sup>4</sup> Coryell County, Texas, *Report of Road Supervisor*, vol. 1 (Coryell County Courthouse, Gatesville, Texas), p. 5 (May 12, 1914), p. 9 (July 13, 1914), and November 13, 1914; Coryell County, Texas, *Commissioners' Court Minutes*, vol. G (Coryell County Courthouse, Gatesville, Texas), pp. 1-5, 12-13 (March 8, 1915).

<sup>5</sup> Shannon Miller, *The First 50 Years: 1918-1968* (Dallas: Austin Bridge Company, 1974), pp. 1-2.

<sup>6</sup> Allen T. Comp and Donald Jackson, *Bridge Truss Types: A Guide to Dating and Identifying*, Technical Leaflet 95 (American Association for State and Local History, May 1977), p. 7.

plate that is almost rectangular but for the corner cut off by the inclined end post (see Figure 6). A roughly contemporary example by the Alamo Construction Company demonstrates an alternate solution (see Figure 7).

**D. Preservation**

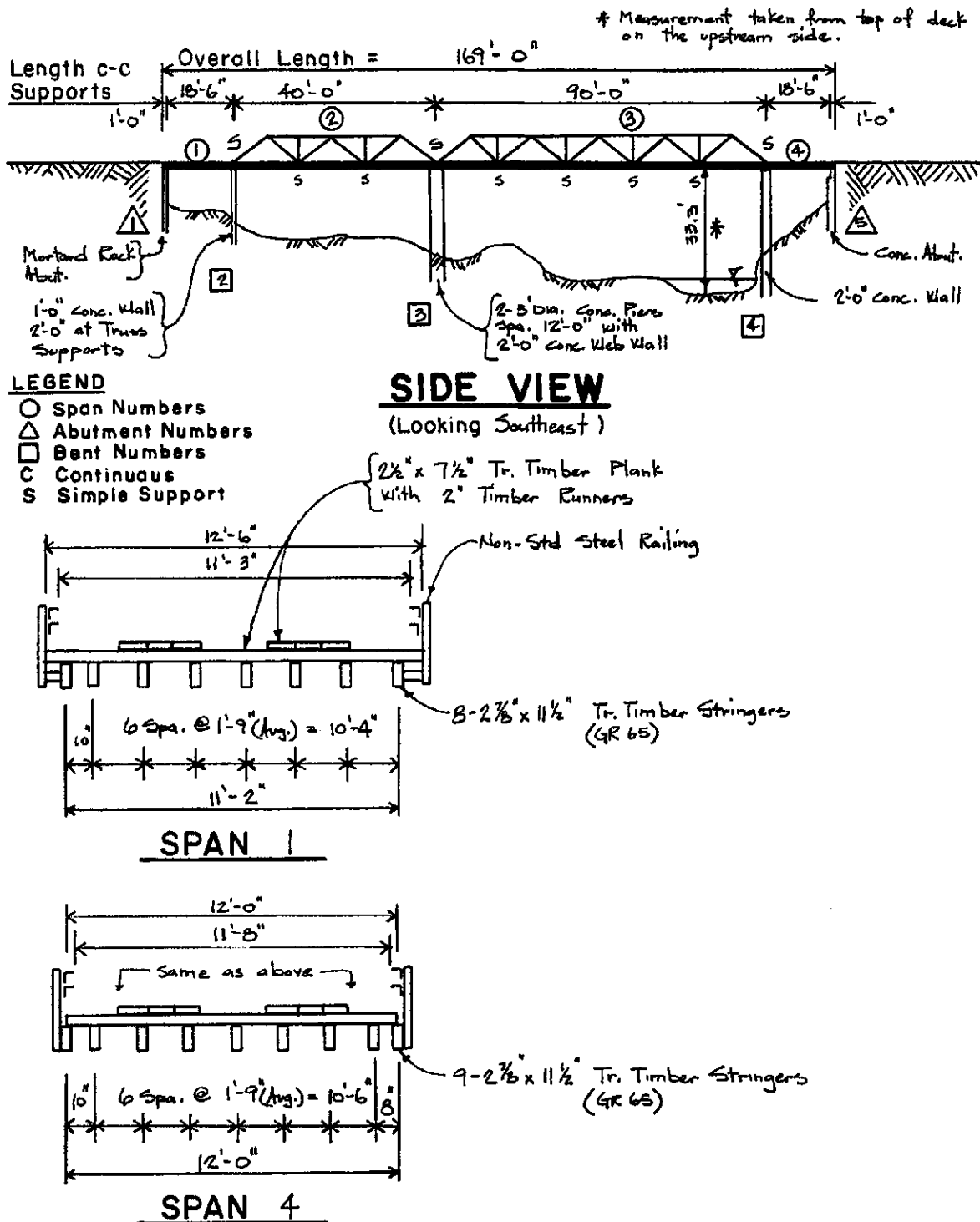
In 1995 the Bone Crossing Bridge was moved to the fair grounds of the Early Day Tractor and Engine Association in Temple, Bell County, Texas. A member of the Association, Darwin Ivicic, an engineering specialist with TxDOT's Waco district, became aware that the bridge was scheduled for demolition. Even though the Association had no practical need for a bridge, it was moved to its current location in order to preserve the bridge and out of a general interest in artifacts of Texas' agricultural past.

**SOURCES CONSULTED**

- Comp, Allen T., and Donald Jackson. *Bridge Truss Types: A Guide to Dating and Identifying*. Technical Leaflet 95. American Association for State and Local History, May 1977.
- Coryell County Genealogical Society. *Coryell County, Texas Families: 1854-1985*. Gatesville, Texas: Coryell County Genealogical Society, 1986.
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- Freeman, Charles E. *History of Pearl, Texas*. 2nd ed. Copperas Cove, Texas: self-published, 1974.
- Kelm, William F. Bridge Inspection Report, July 29, 1994. Texas Department of Transportation District Office, Waco, Texas.
- Miller, Shannon. *The First 50 Years: 1918-1968*. Dallas: Austin Bridge Company, 1974.
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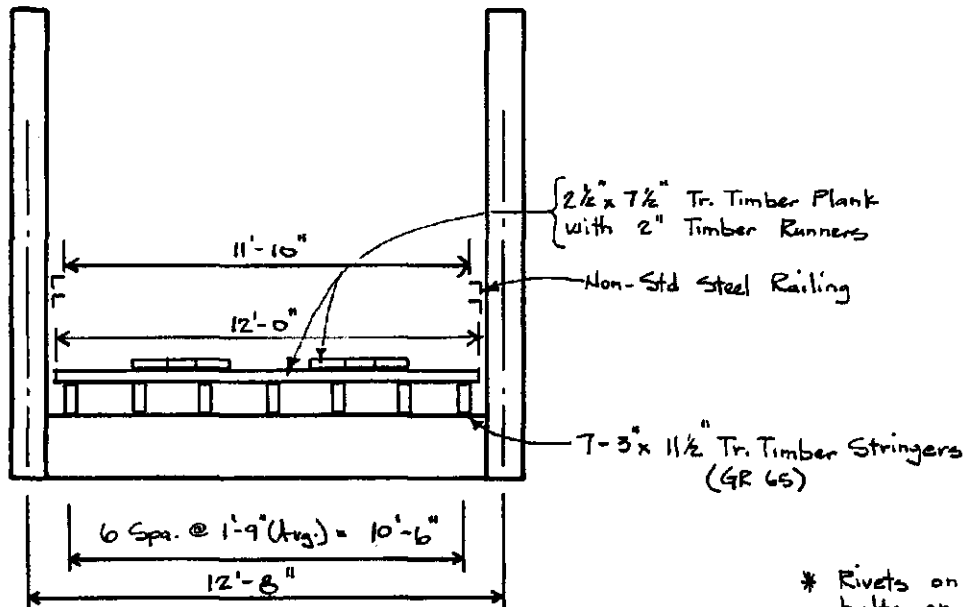
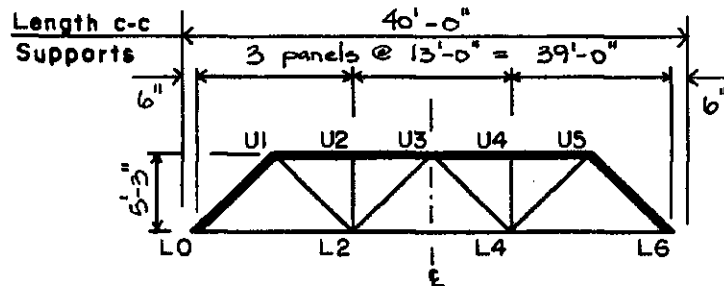
## APPENDIX: Figures

**Figure 1** Overall elevation and section of spans 1 and 4, from William F. Kelm, Bridge Inspection Report, July 29, 1994 (Texas Department of Transportation District Office, Waco, Texas).



**Figure 2** Elevation and section of span 2 (40'-0" span), from William F. Kelm, Bridge Inspection Report, July 29, 1994 (Texas Department of Transportation District Office, Waco, Texas).

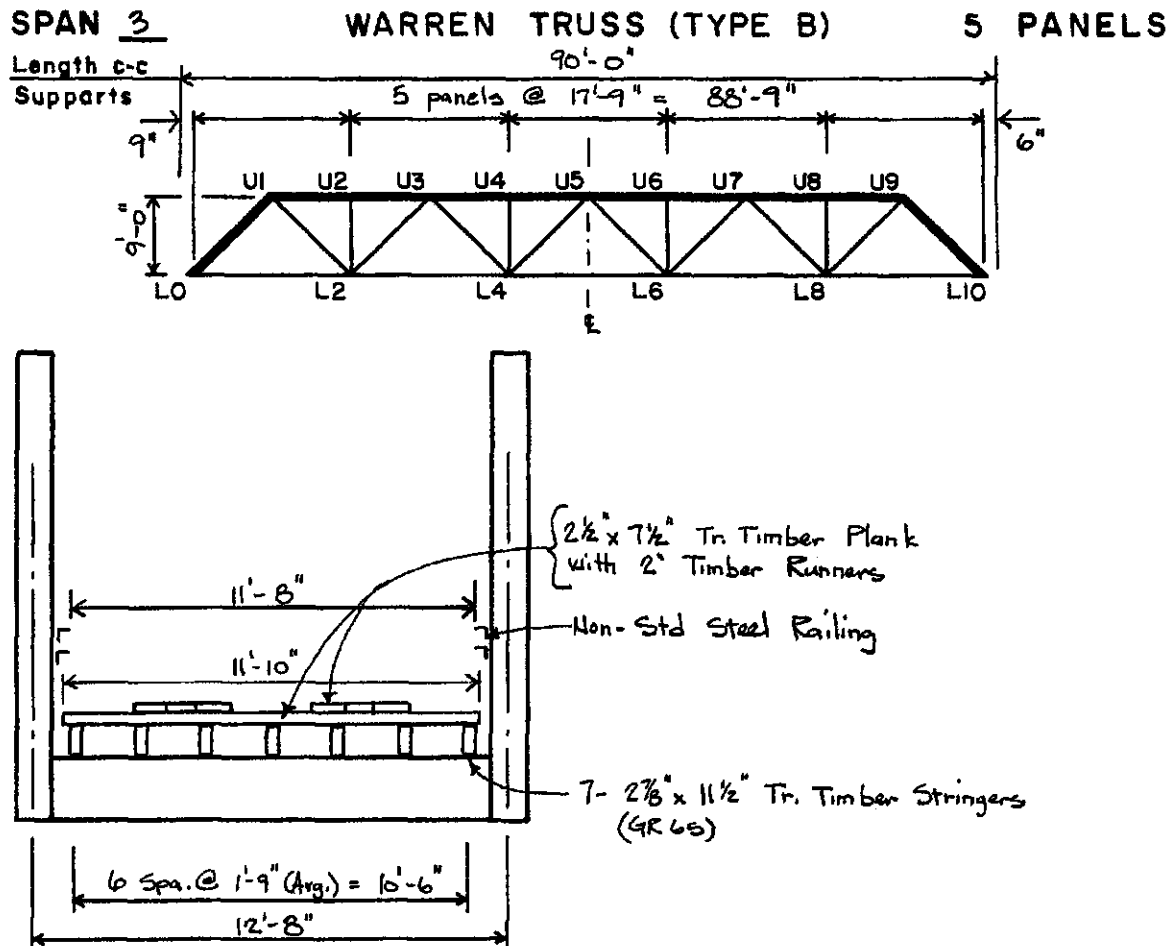
**SPAN 2 WARREN TRUSS (TYPE B) 3 PANELS**



\* Rivets on one end and bolts on other end.

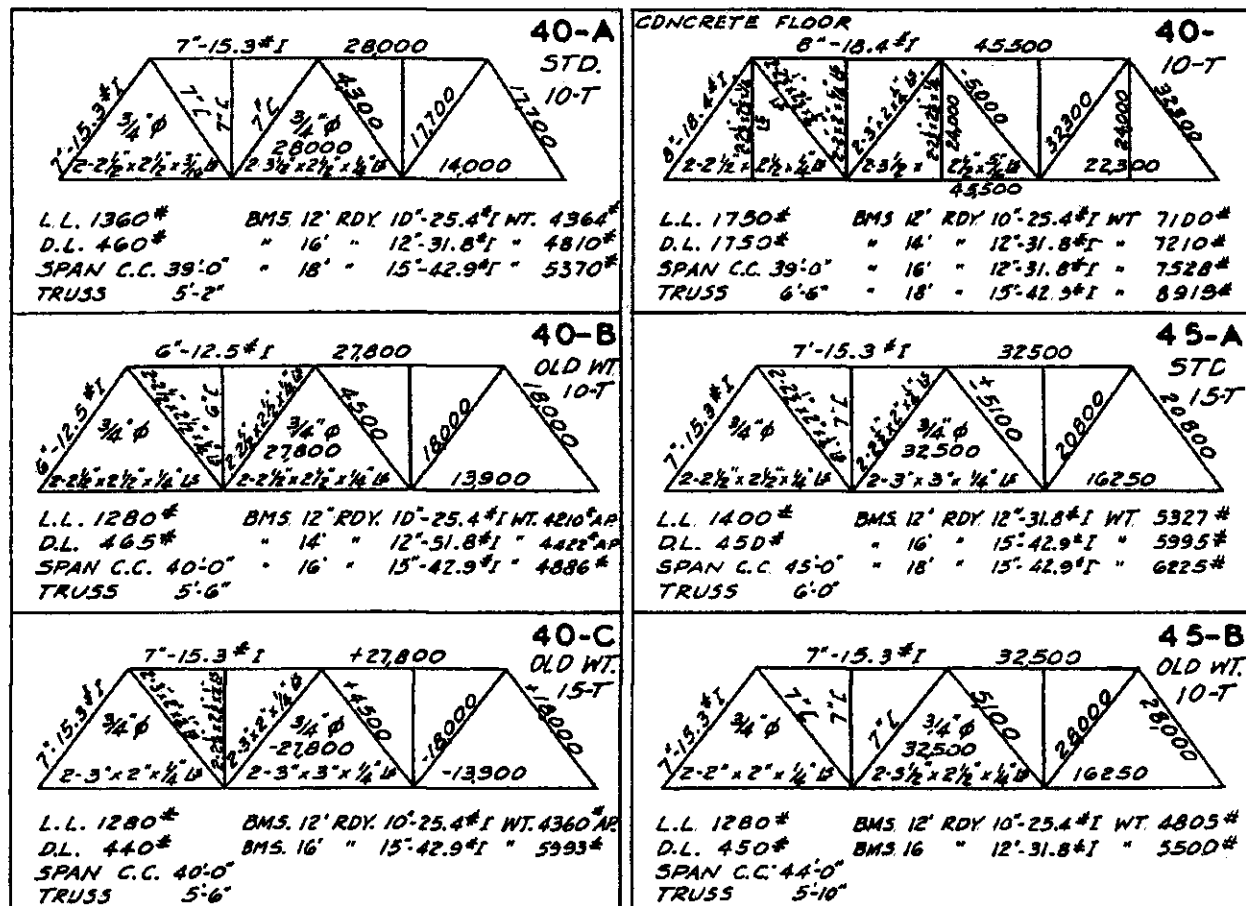
MEMBER	NAME	DESIGNATION	d	bf	tw	tf	SKETCH	CONNECTION
BOTTOM CHORD	L2 - L4	2-L 3 1/2 x 2 1/2 x 1/4						16 B 5/8" ( 4 )
	L0 - L2	2-L 2 1/2 x 2 x 3/16						12 B 5/8" ( 3 )
TOP CHORD	U1 - U5	S 7 x 15.3	7"	3 5/8"	1/4"			B = Bolt R = Rivet P = Pin ( ) = # of holes at critical x-section
END POST	L0 - U1	S 7 x 15.3	7"	3 5/8"	1/4"			
DIAGONALS	U1 - L2	C 7 x 9.8	7"	2"	3/16"			8 B 5/8" ( 2 ) *
	L2 - U3	C 7 x 9.8	7"	2"	3/16"			4 B 5/8" ( 2 )
VERTICALS	L2 - U2	C 7 x 9.8	7"	2"	3/16"			4 R 5/8" ( 2 )
								( )
FLOOR BEAMS		S 12 x 31.8	12"	5"	5/16"			6 B 5/8" DS, WB3

**Figure 3** Elevation and section of Span 3 (90'-0" span), from William F. Kelm, Bridge Inspection Report, July 29, 1994 (Texas Department of Transportation District Office, Waco, Texas).

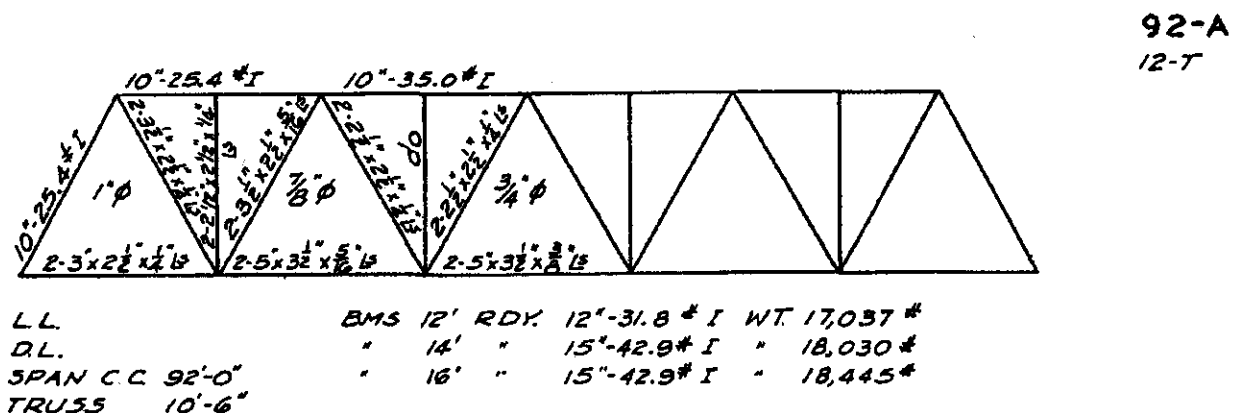


MEMBER	NAME	DESIGNATION	d	bf	tw	tf	SKETCH	CONNECTION
BOTTOM CHORD	L4-L6	2-L 5 x 3 1/2 x 3/8						28 B 3/4" (5)
	L2-L4	2-L 5 x 3 1/2 x 3/16						26 B 3/4" (5)
	L0-L2	2-L 3 x 2 1/2 x 1/4						12 B 3/4" (3)
TOP CHORD	U1-U9	S 10 x 25.4	10"	4 5/8"				B = Bolt R = Rivet P = Pin ( ) = # of holes at critical x-section
END POST	L0-U1	S 10 x 25.4	10"	4 5/8"				
DIAGONALS	U1-L2	2-L 3 1/2 x 2 1/2 x 1/4						16 R 7/8" (5)
	L2-U3	2-L 3 x 2 1/2 x 1/4						6 B 3/4" (2)
								( )
VERTICALS	L2-U2	2-L 2 1/2 x 2 1/2 x 1/4						4 B 3/4" (2)
								( )
FLOOR BEAMS		S 12 x 31.8	12"	5"				6 B 3/4" DS WB5

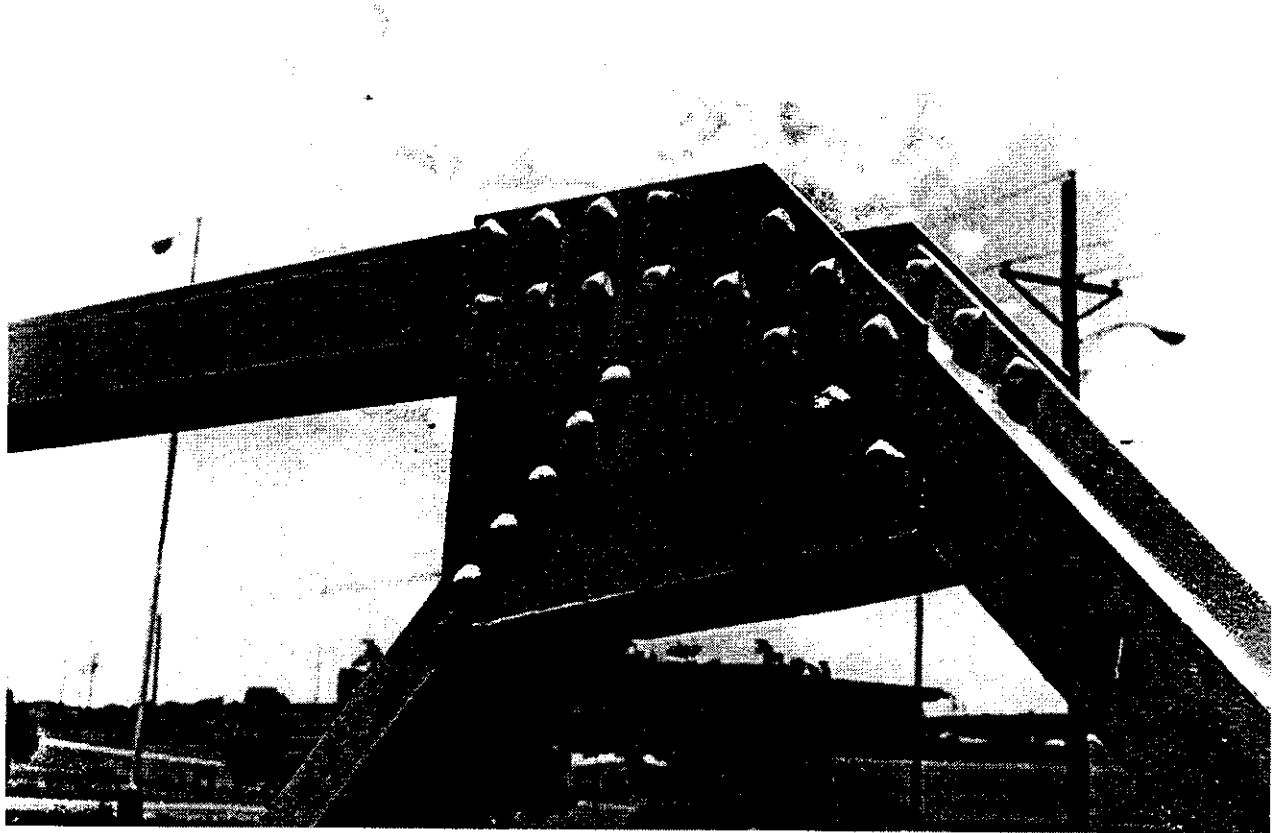
**Figure 4** Schematics for 40-45' trusses, n.d. (Austin Brothers Bridge Company folder, Bridge Manufacturers file, Environmental Affairs Division, TxDOT, Austin, Texas.)



**Figure 5** Schematics for 90' truss, n.d. (Austin Brothers Bridge Company folder, Bridge Manufacturers file, Environmental Affairs Division, TxDOT, Austin, Texas.)



**Figure 6** Detail of Yellowhouse Canyon Bridge, built in 1913 by Austin Brothers Bridge Company. (Photo files, Environmental Affairs Division, TxDOT, Austin, Texas.)



**Figure 7** Detail of Granger Bridge, built in 1915 by Alamo Construction Company. (Photo files, Environmental Affairs Division, TxDOT, Austin, Texas.)

